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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,397	02/23/2005	Miho Iwabuchi	ISH-0228	7543

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EXAMINER	
NOVACEK, CHRISTY L	

ART UNIT	PAPER NUMBER
2822	

MAIL DATE	DELIVERY MODE
08/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

TH

Office Action Summary	Application No.	Applicant(s)	
	10/525,397	IWABUCHI, MIHO	
	Examiner	Art Unit	
	Christy L. Novacek	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 February 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/23/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the preliminary amendment filed April 26, 2007.

Drawings

Figure 7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohkubo (US 20010007367).

Regarding claim 1, Ohkubo discloses forming an insulating layer (20) on at least one wafer (10) of two starting wafers and adhering the one wafer to the other wafer without using an adhesive, wherein a PV value (roughness) of a surface of the insulating layer is 0.4 nm (Fig. 3B; para. 0093, 0106-0108, 0102).

Regarding claim 3, Ohkubo discloses forming an insulating layer (20) on at least one wafer of two starting wafers, implanting hydrogen ions through an upper surface of the one wafer to form a micro-bubble layer in the interior of the wafer, thereafter bringing the surface of the one wafer through which ions have been implanted into contact with the other wafer through the insulating layer interposed therebetween, then separating a part of the one wafer with the micro-bubble layer as a cleavage plane by applying heat treatment for the rest to become a thin film, and bonding strongly the one wafer in the form of a thin film to the other wafer through the insulating layer interposed therebetween by applying further heat treatment (para. 0103-0111).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2, 4 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo (US 20010007367) in view of Aga et al., (WO 01/28000).

Regarding claim 2, Ohkubo discloses that the PV value (roughness) of the surface of the insulating layer is 0.4 nm, but Ohkubo does not disclose using a wafer free of a pit cluster as the starting wafer. Like Ohkubo, Aga discloses a process of forming an SOI wafer. Aga discloses that it is preferable to use a wafer that is free of a pit cluster on the surface when forming an SOI wafer because pit clusters cause delamination of the SOI wafer (Examples 3 and 4). At the time of the invention, it would have been obvious to one of ordinary skill in the art to use a wafer that

is free of pit clusters on the surface as the starting wafer of Ohkubo because Aga teaches that it is preferable to use a wafer that is free of pit clusters when forming an SOI wafer because pit clusters cause the SOI wafer to delaminate.

Regarding claims 4 and 7-9, Aga discloses inspecting the surface of a starting wafer for the presence or absence of a pit cluster and using wafers having no pit cluster thereon as the starting wafers because pit clusters cause delamination of the SOI wafer (Examples 3 and 4). At the time of the invention, it would have been obvious to one of ordinary skill in the art to use a wafer that is free of pit clusters on the surface as the starting wafer of Ohkubo because Aga teaches that it is preferable to use a wafer that is free of pit clusters when forming an SOI wafer because pit clusters cause the SOI wafer to delaminate.

Regarding claim 6, Ohkubo discloses forming an insulating layer (20) on at least one wafer of two starting wafers, implanting hydrogen ions through an upper surface of the one wafer to form a micro-bubble layer in the interior of the wafer, thereafter bringing the surface of the one wafer through which ions have been implanted into contact with the other wafer through the insulating layer interposed therebetween, then separating a part of the one wafer with the micro-bubble layer as a cleavage plane by applying heat treatment for the rest to become a thin film, and bonding strongly the one wafer in the form of a thin film to the other wafer through the insulating layer interposed therebetween by applying further heat treatment (para. 0103-0111).

Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo (US 20010007367) in view of Fukami et al. (US 6,060,396, cited in IDS).

Regarding claims 5 and 11, Ohkubo does not disclose polishing the starting wafers in an environment where a heavy metal concentration is 10 ppb or less. Fukami discloses it is

beneficial to mirror polish semiconductor wafers in an environment where the heavy metal concentration is 0.01 to 1 ppb so that the wafers obtain a smooth surface without being contaminated by heavy metals that would otherwise degrade the operation of the semiconductor device (Abstract; col. 1, ln. 15-65). At the time of the invention, it would have been obvious to one of ordinary skill in the art to polish the starting wafers of Ohkubo in an environment where the heavy metal concentration is 0.01 to 1 ppb because Fukami discloses that it is advantageous to polish semiconductor wafers such that they are not contaminated by heavy metals.

Claims 10 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo (US 20010007367) in view of Aga et al., (WO 01/28000), as applied to claims 2, 4 and 6-9 above, and further in view of Fukami et al. (US 6,060,396).

Regarding claims 10 and 12-16, Ohkubo does not disclose polishing the starting wafers in an environment where a heavy metal concentration is 10 ppb or less. Fukami discloses it is beneficial to mirror polish semiconductor wafers in an environment where the heavy metal concentration is 0.01 to 1 ppb so that the wafers obtain a smooth surface without being contaminated by heavy metals that would otherwise degrade the operation of the semiconductor device (Abstract; col. 1, ln. 15-65). At the time of the invention, it would have been obvious to one of ordinary skill in the art to polish the starting wafers of Ohkubo in an environment where the heavy metal concentration is 0.01 to 1 ppb because Fukami discloses that it is advantageous to polish semiconductor wafers such that they are not contaminated by heavy metals.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christy L. Novacek whose telephone number is (571) 272-1839. The examiner can normally be reached on Monday-Thursday 4:00pm - 8:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on (571) 272-2429. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CLN
July 30, 2007

Zandra V. Smith
Supervisory Patent Examiner
1 aug 2007